TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION
U.S. DEPARTMENT OF AGRICULTURE · · · FOREST SERVICE
UNIVERSITY FARM No. 411 PAUL 1, MINNESOTA

Thinning From Above Reduces Total Yields in Medium Site Aspen

Early commercial thinnings "from above" in quaking aspen (Populus tremuloides Michx.) may provide early returns from good sized bolts, but they result in lower total yields according to a study conducted by the Lake States Forest Experiment Station on the Chippewa National Forest in Minnesota.

In 1941 a series of plots was installed in 30-year old medium quality aspen to test the practicability of partial cutting in stands of this type. The stand then averaged 4 to 8 inches in diameter. On three plots a thinning was made in the dominant and co-dominant trees 6 inches or more in diameter giving as much consideration as possible to the spacing and vigor of the residual stand--mostly co-dominant, intermediate, and suppressed trees. There were also three check plots on which no cutting was done. Remeasurement of these plots in 1953, 12 growing seasons after establishment, showed the following effects of cuttings:

Table 1.--Growth, total yields, and mortality per acre in thinned and unthinned plots

Treatment	Volume				Net growth 1941-53	Total yield to 1953	Mortality 1941-53	Annual growth 1941-53
	Before cutting-1941	Cut in 1941	After cutting-1941	In 1953				
	Cords	Cords	Cords	Cords	Cords	Cords	Cords	Percent
Cut "from above"	20.7	8.2	12.5	15.9	3.4	24.1	4.7	2.3
No cutting	19.8	---	19.8	26.1	6.3	26.1	6.8	2.6

Compared to the uncut plots, total yields over the 42-year rotation were reduced 2.9 cords per acre in the thinned plots. This loss resulted from reduction in growth during the 12 years after cutting. Some of the poorer growth can be attributed to reduced growing stock; the thinned plots had only 40.3 sq. ft. of basal area per acre after cutting--as compared to 59.3 sq. ft. for the check. Despite the extra growing space, growth percent analysis indicates that individual trees did not grow as well on the thinned plots as on the controls; the uncut plots grew at the rate of 2.6 percent per year, and the cut plots only at 2.3 percent. This probably reflects the poorer vigor of the residual trees on the thinned plots. Mortality was greater on the uncut plots, but this should be expected, since heavier stocking exposed more trees to the factors causing death.

The data from these plots strongly suggest that foresters may have to accept reduced total yields from medium site aspen in return for early income from intermediate commercial cuts in the upper crown classes.

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